

EXAMPLE 11

The equipment employed was the same as in Example 7. The polymer was a 0.905 gr/cc polypropylene resin with a melt flow of 5.0 dg/min. The barrel pressure at the injection port was 200 psig. The regulated pressure was 700 psig, and the resulting extrudate was 0.4 gr/cc while the melt temperature and screw rpm were 182°C. and 15 rpm. The extrudate cell size was from 0.020 inch to an open cell structure. The rod O.D. was 0.407 inch in diameter. When the rpm was increased to 50, the melt temperature dropped to 180°C., the injection port pressure to 100 psig and the regulated pressure was adjusted to 300 psig, the resulting extrudate density increased to 0.67 gr/cc and extruder output rate was 155 gr/min. The extrudate cell size was about 0.024 inch average, the cell structure was closed and the rod O.D. was 0.373 inch. Both of these foams were formed without the aid of a nucleator and were coarse. The bubble size of the 0.4 gr/cc sample varied from an average of 0.020 inch to an open cell structure. The bubble size of the 0.67 gr/cc samples was about 0.024 inch average and bubbles could clearly be seen as opposed to an opaque surface which hides the internal bubble structure.

EXAMPLE 12

The equipment and the resin employed were the same as in Example 11, except that 0.1 percent azodicarbonamide was added to the resin as a cell nucleator. The barrel pressure at the injection port was less than 100 psig. The regulated pressure was 450 psig while the melt temperature and rpm were 180°C. and 25, respectively. These settings resulted in an extrudate of 0.63 gr/cc with a smooth, uniform opaque surface and an internal cell structure ranging in size from 5 to 8 mils (0.005 to 0.008 inches) in diameter. The rod O.D. was 0.435 inch in diameter.

When the regulated pressure was increased to 800 psig, the injection port pressure remained at less than 100 psig and the extrudate density decreased to 0.50 gr/cc. The cell size ranged from an average of 0.005 inch to 0.008 inch. The rod O.D. was 0.391 inch.

Examples 11 and 12 show that a better product is obtained using nucleators to control cell size and obtain an opaque smooth surface; and also that the extrudate density can be varied by changing the regulated pressure.

EXAMPLE 13

The equipment employed was the same as in Example 7, but the polymer was a 1.04 gr/cc polystyrene resin with a 1.4 ft.-lb./in. impact strength. This resin was extruded without nucleators. The injection port pressure was 450 psig, the regulated pressure was 900 psig, the melt temperature was 193°C, the extruder rpm was 20, the output rate was 248 gr/min. and the resulting extrudate density was 0.95 gr/cc. The cell size was about 0.03 inch average and the rod O.D. was 0.288 inch. When the regulated pressure was increased to 2500 psig, the density decreased to 0.77 gr/cc and the cell size was about 0.050 inch average. The rod O.D. was 0.300 inch.

EXAMPLE 14

The equipment employed was the same as in Example 7, except that the extrusion profile die diameter was changed to 0.250 inch and the polymer used was a heat

stabilized polyvinylchloride (PVC) copolymer of a type similar to a chemical blown commercially formulated PVC (without the blowing agent). In the formulation, a number of ingredients could have acted as nucleators.

These ingredients are calcium carbonate, unmelted PVC powder or the impact modifier. The compound has a density of 1.3 gr/cc as a solid, but when extruded under the following conditions the density was reduced to 0.5 gr/cc. The injection port pressure was 2210 psig. The regulated pressure was 4200 psig while the melt temperature and rpm were 182°C. and 15. The extruder output rate was 270 gr/min. The cell size was 0.006 to 0.009 inch in diameter and the rod O.D. was 0.800 inch.

What is claimed is:

1. In the process for the production of a cellular thermoplastic body, wherein solid thermoplastic material is melted under pressure in an extruder, a gaseous blowing agent is injected into the molten thermoplastic material under pressure and admixed and through the mixture of said molten thermoplastic material and said gaseous blowing agent is passed to a zone of reduced pressure to effect the cellular expansion of said thermoplastic material by said gaseous blowing agent, the improvement which comprises metering said gaseous blowing agent at sonic velocity at a point upstream of the injection of said blowing agent into said molten thermoplastic material.

2. The process in accordance with claim 1, wherein said mixture of molten thermoplastic material and injected blowing agent are passed through a wire coating die and onto a conductor to form a coated conductor.

3. The process in accordance with claim 1, wherein said thermoplastic material is selected from the group consisting of polyethylene, polypropylene, and polystyrene and said gaseous blowing agent is gaseous nitrogen.

4. The process in accordance with claim 1, wherein said gaseous blowing agent is metered through a device having a constricting orifice which causes the gas velocity of said gaseous blowing agent to be sonic through the throat of said orifice and thereby effecting injection of said gas into said molten thermoplastic material at a controllable uniform rate unaffected by the material back pressure.

5. In the process for the production of a cellular thermoplastic body, wherein solid thermoplastic material is melted under pressure in an extruder, a soluble gaseous blowing agent is injected into the molten thermoplastic material under pressure and admixed therewith the mixture of said molten thermoplastic material and the solubilized gaseous blowing agent is passed from said extruder to a zone of reduced pressure to effect the cellular expansion of said thermoplastic material by said gaseous blowing agent, the improvement which comprises metering said gaseous blowing agent at sonic velocity at a point upstream of said extruder prior to injection of said blowing agent into said extruder.

6. The process in accordance with claim 5, wherein said mixture of molten thermoplastic material and injected blowing agent are passed through a wire coating die and onto a conductor to form a coated conductor.

7. The process in accordance with claim 5, wherein said thermoplastic material is selected from the group consisting of polyethylene, polypropylene, and polystyrene and said gaseous blowing agent is gaseous nitrogen.